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Deer–vehicle collision statistics and mitigation information: online sources

TERRY A. MESSMER, Jack H. Berryman Institute, Department of Wildland Resources, Utah State University, Logan, UT 84322-5230, USA terrym@ext.usu.edu

DESTINY R. MESSMER, Jack H. Berryman Institute, Department of Wildland Resources, Utah State University, Logan, UT 84322-5230, USA

Abstract: Although good data are lacking, published estimates suggest that >1.5 million deer–vehicle collisions (DVCs) occur annually in the United States. The estimated losses exceed 1 billion dollars. In some states, DVCs are a major cause of reportable accidents. Federal, state, and private partners have cooperated in monitoring trends in DVCs and implementing mitigation measures. Most of this information about such measures is readily available via the Internet. The purpose of this paper is to provide the reader with a broad overview of and a guide to the information currently available online to mitigate DVCs.

Key words: deer–vehicle collision, human–wildlife conflict, wildlife damage management, wildlife–vehicle collision

SINCE CONOVER ET AL. (1995) first published their estimate that 1.5 million DVCs occur in the United States annually, there has been an increase in public concern about human–wildlife conflicts and deer–vehicle collisions (DVCs; Messmer et al. 1999). Messmer et al. (1999) reported that >66% of the U.S. households responding to their 1996 survey stated they experienced negative encounters with wild animals during the previous 5 years. Of these encounters, nearly one-fourth were DVCs.

Many sources offer information about DVCs and strategies about how to mitigate their occurrences. The sources include federal and state transportation and wildlife agencies, major insurance companies, regional consortia, nonprofit organizations, county and city governments, industry, and environmental organizations. The purpose of this paper is to provide an overview of sources of information regarding DVCs.

Federal Highway Administration

The Federal Highway Administration (FHWA) is part of the U.S. Department of Transportation and is responsible for ensuring that U.S. roads and highways are safe. Although state and local governments own most of the nation's highways, FHWA provides financial and technical support for constructing, improving, and preserving these highway systems (Federal Highway Administration 2007).

Highway safety is a major priority for FHWA. On average, there are 115 human fatalities per day on U.S. roads; of these, one is the result of

a DVC (Conover et al. 1995). To support DVC mitigation efforts, FHWA provides advice, supports safety research (Transportation Research Board 2006), tests technology (Innovations Report 2006) and provides information to states regarding strategies to reduce the severity and frequency of crashes.

U.S. Forest Service

The U.S. Forest Service (USFS) is an agency of the U.S. Department of Agriculture (USDA). Its staff, stationed in several geographical regions, manage >78 million ha of public lands in national forests and grasslands. Because many of the national forests are impacted by transportation systems, the USFS works to mitigate the effects of traffic on wildlife. To facilitate this effort, the USFS, in conjunction with a number of partners, has developed, the Wildlife Crossing Toolkit (U.S. Forest Service 2005). The toolkit consists of a searchable database of mitigation measures, case histories, and articles on techniques implemented to decrease wildlife mortality and increase animals' ability to cross highways.

U.S. Department of Agriculture, Animal and Plant Health Inspection Service, Wildlife Services

The USDA/APHIS/Wildlife Services is a versatile federal agency that promotes U.S. agricultural health by conducting wildlife damage management activities (U.S. Department of Agriculture 2007). Wildlife Services conducts research and operational programs

to mitigate the impacts of wildlife damage, including DVCs. For example, an Ohio study calculated the average cost of a DVC and illustrated the potential gains in economic efficiency from various approaches for reducing DVCs (Schwabe et al. 2001).

U.S. Centers for Disease Control

The U.S. Centers for Disease Control (CDC) is a major operating arm of the U.S. Department of Health and Human Services. The CDC's efforts include programs that promote prevention of injuries and diseases to wildlife and those caused by wildlife. Information regarding DVCs is part of this effort (U.S. Centers for Disease Control 1991).

State departments of transportation

State departments of transportation are responsible for administering transportation systems and programs within their respective boundaries. Several state agencies maintain programs to monitor and reduce DVCs. For example, the Kansas Department of Transportation is responsible for highway construction and maintenance and motor vehicle safety in the state of Kansas. It is involved in many public education initiatives to increase public awareness and responsiveness about mitigating DVCs. As part of this safety effort, it regularly distributes news releases alerting Kansas motorists to DVC status and risks in the state (Kansas Department of Transportation 2004).

State wildlife agencies

State wildlife agencies manage wildlife resources within their respective boundaries. The services provided include public lands management, wildlife law enforcement, and programs to mitigate the effect of development on wildlife populations. This often includes efforts to reduce DVCs through public awareness, research, and monitoring DVC status.

City and county governments

Local governments work together to develop programs, such as community and economic development, corrections, emergency management, environmental protection, health, human services, libraries, parks, recreation, and public safety. County governments also have im-

plemented programs to reduce DVCs in their jurisdiction.

For example, Montgomery County, Maryland, has developed an innovative program called the Deer Management Work Group. This group meets regularly to assess the status of DVCs and the measures implemented to reduce them. Public information and education are major components of the work group's efforts. The latest data collected indicate that DVCs in the county were slightly lower in 2006, down to 1,951 (Montgomery County Department of Parks 2007).

Insurance industry

The insurance industry consists of insurance carriers that provide policies and coverage to individuals to mitigate financial losses resulting from a variety of hazards. Providing information to their policy holders on how to avoid DVCs is a major component of the insurance industry's accident-reduction program.

Insurance Institute for Highway Safety

The Insurance Institute for Highway Safety (IIHS) is a nonprofit organization that seeks to educate the public in order to reduce DVCs. Its home page hosts links to accident status reports and current DVC mitigation research (Insurance Institute for Highway Safety 2007).

Insurance-Canada

Insurance-Canada Inc. maintains a website that provides information to consumers and industry professionals about auto insurance in Canada. However, it is not an insurance company, but, rather, a clearinghouse for information regarding insurance issues in Canada. It also provides consumers with information on mitigating DVCs (Insurance-Canada 2006).

Ohio Insurance Institute

The Ohio Insurance Institute is an association representing property and casualty insurance companies and organizations conducting business in Ohio. The member services it provides include public educational information on research and legislative affairs. Providing consumer DVC alerts is part of its public information programs. Its website also provides links to DVC statistics and time-of-day DVC information (Ohio Insurance Institute 2004).

State Farm Insurance

State Farm Insurance is an insurance agency and financial institution that serves consumers in United States and Canada. State Farm has collected data from its claim statistics and put together information for drivers about the frequency of DVCs and which states are at the highest risk. Its data indicate that the states with the highest number of DVCs in 2005 were Pennsylvania, Michigan, Illinois, Ohio, Georgia, Minnesota, Virginia, Indiana, Texas, and Wisconsin (State Farm Insurance 2006).

Erie Insurance

Erie Insurance is a nationwide insurance company and one of the few insurance carriers that tracks DVC claims. It uses the information to help policyholders focus on how to reduce collisions by looking at the frequency, location, severity, and total costs (Erie Insurance 2006).

Insurance Information Institute

The Insurance Information Institute is an organization that provides insurance information. The institute is recognized by the media, governments, regulatory organizations, universities, and the public as a primary source of information, analysis, and referral concerning insurance. The institute also issues press releases to alert users of the risks of DVCs and how to mitigate them (Insurance Information Institute 2003).

Private organizations

Environmental organizations typically are organizations whose missions focus on the preservation of the environment. Such organizations may function on a global, regional, national, or local scale. Some of the organizations include DVC reduction as part of their overall mission.

Chiltern Woodlands Project

The Chiltern Woodlands Project is an independent nonprofit organization started by the Chiltern Society, located in London, England. The aim of this organization is to promote and encourage the sensitive and sustainable management of Chiltern Woodlands in order to protect the landscape and maintain and enhance the biodiversity of the Chiltern Hills. The organization's newsletter, "News of the

Woods," addresses the issue of increasing DVCs in the United Kingdom. To monitor DVC trends, it launched "The Deer Initiative" program (Hooten 2003).

Humane Society of the United States

The Humane Society of the United States (HSUS) is the nation's largest animal protection organization. The HSUS works to reduce animal suffering and to create meaningful social change for animals. It advocates for public policies to protect animals, investigates cruelty to animals, works to enforce existing laws, and educates the public about the issues in a variety of ways. For example, it posted information on its website about how to avoid hitting wildlife on the roads (Humane Society of the United States 2007).

Universities

Several centers or institutes within universities maintain websites that provide DVC statistics and information on DVC mitigation.

Deer-Vehicle Crash Information Clearinghouse

The Deer-Vehicle Crash Information Clearinghouse (DVCIC) is housed at the University of Wisconsin at Madison. The DVCIC is a project funded by the Wisconsin Department of Transportation has committee members from the natural resources and transportation departments of the 5 states in the region, including Illinois, Iowa, Michigan, Minnesota, and Wisconsin. The goal of DVCIC is to provide a central location for timely and pertinent information that will assist users in reducing DVCs (Deer Crash 2007).

Center for Transportation and the Environment

The Center for Transportation and the Environment, located at North Carolina State University, conducts research, education, and technology transfer to mitigate the impacts of surface transportation on the environment (Center for Transportation and the Environment 2007). Its efforts and information concerning DVCs can be found on its home page, <<http://cte.ncsu.edu/cte>>.

Jack H. Berryman Institute

The Jack H. Berryman Institute is a national

institute for resolving human–wildlife conflicts. Based in the Department of Wildland Resources at Utah State University and the Department of Fisheries and Wildlife at Mississippi State University, its website provides links to publications concerning DVCs. The institute's scholarly journal, *Human–Wildlife Conflicts*, contains peer-reviewed articles on a variety of science research topics concerning DVCs and other human–wildlife conflicts. The journal also is available as an open-access resource through the Berryman Institute website (Jack H. Berryman Institute 2007).

Other sources of information

International Conference on Ecology and Transportation

The International Conference on Ecology and Transportation (ICOET) meets every 2 years. Presenting statistics on DVCs is 1 of its functions. The ICOET found that human fatalities from DVCs had a 24% annual increase nationwide from 1994 to 2003 (International Conference on Ecology and Transportation 2005).

Highway Safety Information System

The Highway Safety Information System (HSIS) is a multi-state database that contains data about crashes, roadway inventory, and traffic volume for California, Illinois, Maine, Utah, Michigan, Minnesota, North Carolina, Ohio, and Washington. The participating states were selected based on the quality of available data and their ability to merge data from the various files. An investigation on vehicle crashes with animals was conducted using HSIS database, but only 5 states were included in the analysis: Illinois, Maine, Minnesota, Utah, and Michigan. The results of the investigation suggested that vehicle–animal crashes may pose a much larger problem in some states than in others (Highway Safety Information System 2007).

Transportation Research Institute System

The Transportation Research Institute System is a bibliographic database of transportation-related topics (Transportation Research Institute System 2007). The system is funded by sponsors

of the Transportation Research Board, which includes state departments of transportation and selected federal transportation agencies.

Conclusions

This overview was prepared to guide the reader to web-based sources that provide specific types of information. Thus, it is more a sampling than a comprehensive review of all the information source readily available to someone who has Internet access. At this point a word of caution is in order. Website addresses are subject to change, and some sites may contain subjective information rather than scientifically-proven material. Lastly, the use of specific companies, organizations, and websites in this article does not constitute either an endorsement or censure of those sources.

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